What is claimed is:

1. A method for removing a virus from a liquid sample, the method comprising:

obtaining a membrane engrafted with polymeric side chains having one or more functional groups that interact with viruses, wherein the membrane has a nominal pore size between 20 nm and 1000 nm; and

passing the sample through the membrane to remove viruses from the sample.

2. The method of claim 1, wherein the membrane has a nominal pore size between 200 nm and 500 nm.

3. The method of claim 1, wherein the membrane comprises polypropylene and the polymeric side chains comprise diethylaminated poly(glycidyl methacrylate).

4. The method of claim 1, wherein the polymeric side chains have an average length between 50 nm and 2000 nm.

5. The method of claim 1, wherein the polymeric side chains have an average length between 500 nm and 1000 nm.

6. The method of claim 1, wherein between 1.0e16 and 1.0e20 of the side chains are engrafted per square meter of the membrane's surface area.

7. The method of claim 1, wherein between 1.0e17 and 1.0e18 of the side chains are engrafted per square meter of the membrane's surface area.

8. The method of claim 1, wherein the membrane has a degree of grafting between 50% and 500%.

9. The method of claim 1, wherein the membrane has a degree of grafting between 150% and 300%.

10. The method of claim 1, wherein the method is effective to remove at least 99.999% of virus particles from the sample.

11. The method of claim 1, wherein the method is effective to remove at least 99.99999% of virus particles from the sample.

12. The method of claim 1, wherein the virus is a retrovirus.

13. The method of claim 1, wherein the sample comprises a protein, and wherein less than 10% of the protein is removed from the sample in said passing step.

14. The method of claim 13, wherein less than 2% of the protein is removed from the sample.

15. The method of claim 13, wherein the sample is a plasma sample, and the method results in less than a five-fold increase in the plasma sample's clotting time.

16. The method of claim 1, wherein the sample flows through the membrane at a rate of 1 to 1000 ml/min per square centimeter of membrane.

17. The method of claim 1, wherein the sample flows through the membrane at a rate of 20 to 200 ml/min per square centimeter of membrane.

18. The method of claim 1, further comprising eluting the virus from the membrane with an eluent solution to obtain a suspension of substantially purified virus in the eluent solution.

19. The method of claim 18, wherein the eluent solution comprises sodium chloride.

20. The method of claim 18, wherein the purified virus is bioactive.

21. The method of claim 18, wherein the purified virus is concentrated more than 100-fold relative to the sample.

22. A method of removing viruses from the blood of an individual having a viral infection, the method comprising:

obtaining a membrane engrafted with polymeric side chains having tertiary amino functional groups, wherein the membrane has a nominal pore size between 20 nm and 1000 nm;

sequestering blood cells from the individual's blood using a plasma separator to produce sequestered blood cells and plasma;

passing the plasma through the membrane to produce filtered plasma;

combining the filtered plasma with the sequestered blood cells to produce filtered blood; and

returning the filtered blood to the individual; thereby removing viruses from the blood.

23. The method of claim 22, wherein the patient is infected with a hepatitis virus or human immunodeficiency virus.

24. A device for removing viruses from a liquid sample, the device comprising a membrane engrafted with polymeric side chains having one or more functional groups that interact with viruses, wherein the membrane has a nominal pore size between 20 nm and 1000 nm.

25. The device of claim 24, wherein the functional groups are positively charged at physiological pH.

26. The device of claim 24, wherein the functional groups are secondary, tertiary, or quaternary amino groups.

27. The device of claim 24, wherein the membrane has a nominal pore size between 100 nm and 500 nm.

28. The device of claim 24, wherein the membrane comprises polyethylene and the polymeric side chains comprise diethylaminated poly(glycidyl methacrylate) ("DEA-PGMA").

29. The device of claim 24, wherein the polymeric side chains have an average length between 50 nm and 2000 nm.

30. The device of claim 24, wherein the polymeric side chains have an average length between 500 nm and 1000 nm.

31. The device of claim 24, wherein between 1.0e16 and 1.0e20 of the PGMA side chains are present per square meter of the membrane's surface area.

32. The device of claim 24, wherein the membrane has a degree of grafting ("DG") between 50% and 500%.

33. The device of claim 1, wherein the sample flows through the membrane at a rate of 1 to 1000 ml/min per centimeter length of said membrane.

34. A method of generating virus particles, the method comprising

culturing a virus infected cell line in a culture medium under conditions suitable for the production of viruses;

flowing culture medium containing virus particles through a filter comprising a membrane engrafted with polymeric side chains having tertiary amino functional groups, wherein the membrane has a nominal pore size between 20 nm and 1000 nm;

eluting virus particles from the membrane.

35. The method of claim 34, further comprising storing the virus particles under conditions suitable for long-term storage.

36. The method of claim 35, wherein long-term storage is at 4°C.

37. A device for generating virus particles comprising:

a bioreactor comprising a vessel suitable for containing a culture medium for the generation of viruses; and

a filter comprising at least one membrane engrafted with polymeric side chains having tertiary amino functional groups, wherein the membrane has a nominal pore size between 20 nm and 1000 nm,

wherein the filter is functionally connected to the bioreactor so as to allow virus particles produced in the bioreactor to contact the membrane.

38. The device of claim 37, wherein the bioreactor further comprises a heater to heat the vessel.

39. The device of claim 37, wherein the bioreactor further comprises a refrigerator to cool the filter.

40. The device of claim 37, wherein the one or more membranes comprise hollow fibers.